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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,459	05/24/2006	Anne-Marie Caminade	1004900-000277	5519

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BUCHANAN, INGERSOLL & ROONEY PC  
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EXAMINER
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DOLLINGER, MICHAEL M

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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03/17/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/580,459	<b>Applicant(s)</b> CAMINADE ET AL.	
	<b>Examiner</b> MIKE DOLLINGER	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 54-63, 65-74, 76-86, 89-91 and 94-122 is/are pending in the application.
- 4a) Of the above claim(s) 89-91, 94-106, 121 and 122 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 54-63, 65-70, 72, 74, 76-84, 108-113 and 115-119 is/are rejected.
- 7) ☒ Claim(s) 71, 73, 85, 86, 114 and 120 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Newly submitted claims 121 and 122 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 121 is directed to the invention of Group IV along with withdrawn claims 89, 94 and 95-99 and claim 122 is directed to the invention of Group VII along with withdrawn claims 103-106.
2. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 121 and 122 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Response to Amendment***

3. **Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.**

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct

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from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 54, 55, 58, 59, 61-63, 65, 66, 68-70, 72, 76, 77 and 80-84 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 60, 62-73, 75-78, 80-83 and 88 of copending Application No. 10/580422. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the instant claims lies within the scope of the copending claims and so the instant claims anticipate the copending claims. It is clear that all the elements of the copending claims are to be found in the instant claims as the copending claims fully encompass the instant claims. The difference between the copending claims and the instant claims is that the instant claims contain more elements and thus outline a more specific invention. Thus the invention of the instant claims is in effect a "species" of the "generic" invention of the copending claims. It has been held that the generic invention is "anticipated" by the "species". See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993). Since the

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copending claims are anticipated by the instant claims, they are not patentably distinct from the copending claims.

Instant claim	Corresponding Copending Claim
54	60
55	64
56	-
57	-
58	62
59	63
60	-
61	68
62	67
63	69
64	70
65	71
66	72
67	-
68	75
69	76
70	77
71	-
72	78
73	-
74	-
75	80
76	82
77	83
78	-
79	-
80	88
81	65
82	66
83	73
84	81
85	-
86	-
87	-
88	-

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

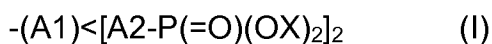
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 54-57, 60-63, 65-69, 79 and 80-83 are rejected under 35 U.S.C. 102(b) as being anticipated by Killat et al. (US 4,871,779).
6. Claim 64 (which is now incorporated into claim 54) as well as claims 65-69 should have been rejected in the previous office action under Killat et al. Examiner did not recognize that independent claim 54 lists the generation chains as **optional**. Henceforth, any further limitation towards the generation chains in a claim that does not require the presence of generation claims is interpreted to further limit a claim element that is not required. Henceforth the prior art does not need to recite the structure of the generation chains in the claims. However, if the claims were amended to make the generation claims required in the dendritic polymer, the following rejection would be obviated.
7. Regarding claims 81 and 82, again these claims should have been rejected in the previous office action under Killat et al. Examiner did not recognize that **claims 81 and 82 do not require that X be an M<sup>+</sup> cation**. So claims 81 and 82 further limit a claim element that is not required to be present. However, if the claims were amended to require that X be an M<sup>+</sup> cation, the following rejection would be obviated.

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8. Regarding claim 54, applicants claim a dendritic polymer of generation 0 to 12, a central core of valence of 1 or more, generation and optionally intermediate chains, a terminal group at the end of each intermediate chain represented by the formula (I):



wherein A1 represents the radical --CR< or -Heteroatom<; the radicals A2, which are identical or different, each independently of the other represents a single bond or a linear or branched hydrocarbon chain having from 1 to 6 chain members; X represents a radical -alkyl, -Aryl, -H or /M where M is a cation. Killat et al. disclose dense star polymers (column 2 lines 26-27) with at least one dendritic branch (column 2 line 27), at least two terminal ion exchange moieties on each dendritic branch (column 2 lines 28-29) that is preferably phosphonate or phosphonium (column 6 lines 58-61). The dendritic polymer may have a PAMAM (polyamidoamine) structure, a ternary or trivalent core molecule, and second generation dendritic branches (column 10 lines 15-18). The biphosphonic terminals can be added through the direct reaction of the --NH<sub>2</sub> ends of the dendrons with chloromethylphosphonate (column 7 lines 19-24). This dendritic polymer would have a core valence of 3 or 4; generation of 2; A1< is the radical N<; X is H; and A2 is methyl.

9. Regarding claim 55, applicants claim a dendritic polymer having a structure of the DAB, PAMAM, or PMMH type. Killat et al. disclose a dendritic polymer of the PAMAM type (column 10 lines 15-16).

10. Regarding claim 56, applicants claim the dendritic polymer wherein A1 represents the radical -CH< or -N<. Killat et al. disclose a dendritic polymer that is

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biphosphonated by directly reacting the  $\text{-NH}_2$  end of the dendrons with chloromethylphosphonate (column 7 lines 19-24); this dendritic polymer will have terminals wherein A1 is the radical  $\text{-N<}$ .

11. Regarding claim 57, applicants claim a dendritic polymer wherein A2 represents  $\text{-Me-}$ . Killat et al. disclose a dendritic polymer that is biphosphonated by directly reacting the  $\text{-NH}_2$  end of the dendrons with chloromethylphosphonate (column 7 lines 19-24); this dendritic polymer will have terminals wherein A2 is an  $\text{-Me-}$ .

12. Regarding claim 60, applicants claim a dendritic polymer with a core with valence 1 to 8. Killat et al. disclose a core molecule with a valence from 2 to about 2,300 (column 10 lines 47-48).

13. Regarding claim 61, applicants claim a dendritic polymer with a core with valence 3, 4 or 6. Killat et al. disclose a core molecule that is ternary or trivalent (column 10 line 15).

14. Regarding claim 62, applicants claim a dendritic polymer with 0 to 2 generations. Killat et al. disclose a dendritic polymer with 2 to 6 generations (column 10 line 64).

15. Regarding claims 79 and 80, applicants claim formulae of the dendritic polymer generation and intermediate branches that applicants have admitted are commercially available and anticipated by PAMAM dendritic polymers (page 17 2<sup>nd</sup> paragraph of specification). Henceforth the dendritic polymers of Killat et al., being of PAMAM structure and having biphosphonic terminals, anticipate these claims.



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16. Claims 54, 55, 57-61, 63, 65-69, 74, 76-78, 81-84, 108-113, 115-119 are rejected under 35 U.S.C. 102(b) as being anticipated by Caminade et al (FR 2734268 A1) hereinafter referred to as Caminade '268.

17. Regarding claims 81 and 82, again these claims should have been rejected in the previous office action under Caminade '268 et al. Examiner did not recognize that **claims 81 and 82 do not require that X be an M<sup>+</sup> cation**. So claims 81 and 82 further limit a claim element that is not required to be present. However, if the claims were amended to require that X be an M<sup>+</sup> cation, the following rejection would be obviated. Claims 116 and 117 are similarly rejected

18. Caminade '268 discloses, in Examples 4-6, 11 and 12, several dendrimers with phosphonic terminals. The Examples include 10-generational [Examples 4-6] and 4-generational [Examples 11 and 12] with PMMH generational chains [Figures 1 and 2]. The ultimate generation reads on the intermediate chains of the claims. The PMMH chains read on the generational chains of claims 63-69 wherein A represents an oxygen atom, B represents a phenyl radical, D represents a hydrogen atoms, E represents a methyl radical, and G represents a sulfur radical [Figures 1 and 2; page 24 lines 13]. The PMMH chains also read on the intermediate chains of claims 74-78 wherein J represents an oxygen atom, K represents a phenyl radical, D represents a hydrogen atom, E represents a methyl radical, Alk represents a methylene radical and a represents 1 or 2 [Figures 1, 2, 6 and 13]. The core molecule is S=P≡ radical [page 24 lines 6-9]. The various terminal groups of Caminade '268 include ones in which: A1 is represented by -P(=S)<, A2 is represented by a 6 membered hydrocarbon chain, and X

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is a phenyl group [Figure 6]; A1 is represented by  $-P(=S)<$ , A2 is represented by a 5 membered hydrocarbon chain, and X is a phenyl group [Figure 8], A1 is represented by  $-P(=S)<$ , A2 is represented by a 4 membered hydrocarbon chain, and X is an ethyl group [Figure 12]; A1 is represented by  $-P(=S)<$ , A2 is represented by a 6 membered hydrocarbon chain, and X is an ethyl group [Figure 13]; and A1 is represented by  $-P(=S)<$ , A2 is represented by a 3 membered hydrocarbon chain, and X is an ethyl group [Figure 14]. Similarly, though not shown with a phosphonic terminal group, the phosphorous containing terminal functionalities may be attached by a terminal group wherein A1 is represented by an  $N<$  radical and A2 is represented by a methylene radical [Figure 5]. Caminade '268 discloses that the core molecule may be derived from  $O=PCl_3$ ,  $S=PCl_3$  or  $P_3N_3Cl_6$  [page 15 lines 23-26] which reads on the core molecule of claim 59.

### ***Allowable Subject Matter***

19. Claims 70-73, 85, 86, 114 and 120 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. Caminade '268 and Killat represent the closest prior art to the allowable claims. Neither Caminade '268 or Killat disclose a combination of the specific combination of generational and intermediate chains of claims 70-73, 85, 86 or 120 nor is there any suggestion or motivation to prepare a dendrimer of this particular combination.

Caminade '268 and Killat also do not disclose phosphonate terminals with cationic

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elements or a nitrogen containing base in the phosphonate groups nor is there any suggestion of motivation to prepare a dendrimer with these particular phosphonate groups.

21. Regarding claim 114, Caminade '268 represents the closest prior art. However, Caminade '268 specifically requires at least 4 generations [abstract; *au moins quatre couches de branches dendritiques*]. There is no suggestion or motivation to prepare a dendrimer of this particular combination of elements with less than four generations, especially since Caminade '268 is attempting to prepare a dendrimer with a surface of terminal functional groups (which generally requires high generation polymers).

22. While claims 81, 82, 116 and 117 are rejected, should the claims be amended to require that X be an M<sup>+</sup> cation and to include all the limitations of the base claim and any intervening claims, they would be found allowable.

23. Claims 70 and 72 are also rejected under ODP, as discussed above. This rejection is held in abeyance until the claims are allowable over the prior art.

### ***Response to Arguments***

24. Applicant's arguments filed 02/04/2010 have been fully considered but they are not persuasive.

25. Applicants argue that the generation chains of claim 54 are different from the generation claims of Killat. This argument is not convincing. As discussed above in the rejection, the generation chains are optional in the claim 54. Henceforth, any further limitation towards the generation chains in a claim that does not require the presence of

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generation claims is interpreted to further limit a claim element that is not required.

Henceforth the prior art does not need to recite the claimed structure of the generation chains.

26. Applicant has not addressed the rejection over Caminade '268 in the response.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIKE DOLLINGER whose telephone number is (571)270-5464. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/mmd/

/RANDY GULAKOWSKI/  
Supervisory Patent Examiner, Art Unit 1796